

REMARKS/ARGUMENTS

Introductory Comments

Applicant thanks the Examiner for informing the Applicant that claims 43-47 are allowed, and that claims 21-26 and 28 would be allowable with minor amendments. As well, Applicant thanks the Examiner for the detailed Office Action, particularly with respect to the Examiner's interpretation of the Nakajima reference.

Summary of Office Action

In the Office Action, claims 1-3, 5, 9, 11-14, 17-18, 27, 29-33, 35-40 and 42 were rejected by the Examiner under 35 U.S.C. 102(b) as being anticipated by German Patent Reference DE 2512065A (Nakajima). Claim 41 was rejected under 35 U.S.C. 103(a) as being unpatentable over Nakajima in view of Finnish Patent Reference FI 000100133 (Ekman), and claim 19 was rejected under 35 U.S.C. 103(a) as being unpatentable over Nakajima in view of U.S. Patent No. US 4,856,577 (Katsu et al.).

Claims 15-16 and 48-50 were rejected under 35 U.S.C. 112, first and second paragraphs, for claiming subject matter insufficiently described in the specification. Corresponding rejections were raised regarding the specification for failing to provide proper antecedent basis for the claimed subject matter, and regarding the drawings for failing to show every feature of the invention specified in the claims.

Claims 43-47 stand allowed.

Claims 21-25 and 28 were deemed allowable if rewritten in independent form.

Claim 26 was deemed allowable if amended to overcome the 35 USC 112 rejection and if rewritten in independent form.

The drawings were also objected to for failing to comply with 37 CFR 1.21(d), presumably because in replacement sheets submitted previously, Figures 4a, 4b, 4c, and 4d were provided on two separate sheets, rather than on a single sheet as originally filed.

Remarks Regarding Amendments

In the Specification:

In paragraph 79, fourth line, "wall 152 defines an inner chamber 160" was amended to read "wall 152 defines an inner enclosure or inner chamber 160 (also called inner space 160)". This was added to facilitate identification of the elements in the specification referred to in the claims.

In the Claims:

Claims 1 and 33 have been amended to include a limitation that the diverter have an adjustable orientation relative to the chambers. Claim 21 has been amended to be in independent form. Claim 24 has similarly been amended to be in independent form. As well, claim 24 has been amended so that the structure

formerly introduced in claim 3 now provides a proper antecedent basis for claim 26. Claim 26 was re-written to more clearly define the structure of the claimed sealing means and to be consistent with amended claim 24.

Claim 48 was amended to include additional limitations in an effort to expedite allowance of claims 48-50. According to the Examiner, claims 48-50 could not be assessed as new or inventive in view of the Section 112 rejections.

In the Drawings:

The drawings submitted previously on 16 sheets have been replaced with the same drawings but on 15 sheets. Figures 4a-4d now appear on a single sheet, instead of two separate sheets, to comply with 37 CFR 1.121(d).

Remarks Regarding Section 112 Claim Rejections

The Examiner rejected claim 15 under each of the first and second paragraphs of 35 USC 112, stating that the limitation "the inner enclosure is substantially disposed within the connection portion", as claimed in claim 15, is not supported by the original disclosure.

The Examiner identified the inner enclosure as being defined by interior walls of the housing, and with reference to Figure 4 of the application, concluded that the enclosure so defined is much bigger than the connection portion, making it impossible that the inner enclosure be substantially disposed within the connection portion.

Applicant respectfully submits that the inner enclosure referred to in the claims is identified at reference character 160 in the embodiment described in the specification and in the Figures (see for example paragraph 79 and Figure 4c). In the application as filed, the inner enclosure 160 was introduced as an "inner chamber" 160. The language "inner chamber" was replaced in the claims with "inner enclosure" to avoid confusion with the first and second chambers recited in the claims (see for example, claim 1, paragraph (a) and (b)) and the chambers identified at reference character 150 in the specification (see for example, paragraph 81 and Figures 4a and 11). Applicant was not intending to introduce new matter, and Applicant submits that merely renaming this term has not added any new matter. The term "inner enclosure" is introduced in claim 3, and claim 3 further states that "the at least one fluid stream diverter is provided in the inner enclosure". The specification and drawings clearly illustrate an inner enclosure (inner chamber 160) defined by an inner wall 152, and in which a diverter 200 is rotatably mounted (see, for example, Figures 4c, 5a, 5b, and 2a), and paragraphs 74 and 86). Accordingly, Applicant respectfully submits that one skilled in the art would understand that the "inner enclosure" as claimed refers to the "inner enclosure 160" of the embodiment described in the specification.

To facilitate a precise interpretation of the claims, Applicant has amended the specification at paragraph 79, so that "wall 152 defines an inner chamber 160" now reads "wall 152 defines an inner enclosure or inner chamber 160 (also called inner space 160)".

In view of the above, Applicant submits that the specification supports the claimed limitations that the inner enclosure 160 is substantially disposed within the dispersion portion 141 of the housing 140 (see Figure 4c), and that fluid

stream diverter 200 has a radial extent that is substantially equal to the radial extent of the inner enclosure. Applicant further submits that these limitations are distinctly claimed in claims 15 and 16. Reconsideration of the claim 15 and 16 rejections pursuant to Section 112 is respectfully requested.

Regarding claim 48, the Examiner stated that the claimed limitation of "a fluid stream diverter disposed in the housing between the dispersion end and the ports of the connection end" is not supported in the original disclosure. In particular, the Examiner stated that with reference to Figure 10, it does not appear that the fluid diverter (200) is disposed between the dispersion end (140) and the ports (143, 144).

Applicant respectfully submits that the specification as filed described the invention as claimed in claim 48 sufficiently to enable one skilled in the art to make use of it. Any fluid flowing between the ports and the dispersion end must flow through the fluid diverter, and in that sense, the fluid diverter is disposed "between" the ports and the dispersion end. Nevertheless, in an effort to expedite allowance, Applicant has amended claim 48 to include a limitation that the housing include an inner enclosure providing fluid communication between the chambers of the dispersion end and the ports of the connection end, and to recite that the fluid stream diverter is substantially disposed in the inner enclosure of the housing. Applicant submits that the structure as claimed in amended claim 48 is consistent with the specification and with Figure 10, and that claims 48 and 49 satisfy the requirements of Section 112. Reconsideration of these rejections is respectfully requested.

Further, Applicant respectfully submits that amended claim 48 is novel and non-obvious in view of the prior art of record. For example, amended claim 48 includes a limitation that at any given diverter orientation, the separate flow communications are not in fluid communication with the same chamber. This language patentably distinguishes amended claim 48 from the Nakajima reference.

Claim 48 further includes limitations that patentably distinguish amended claim 48 from previously cited references, as explained in the Applicant's Response of September 3, 2004 (beginning at page 33, second full paragraph).

In view of the above, Applicant further submits that the specification provides proper antecedent basis for the claimed subject matter. Applicant respectfully requests that the objection to the specification pursuant to 37 CFR 1.75(d)(i) be withdrawn.

Regarding claim 26, the Examiner stated that the recited elements "the interior wall" and "the inner enclosure" lacked sufficient antecedent basis. Applicant has amended the subject matter formerly introduced by claim 3, and now included in independent claim 21 (as amended), to recite "at least one interior wall defining an inner enclosure". Claim 26 has been amended to recite sealing means provided between "the at least one interior wall defining the inner enclosure, and each of the first, second, and third segments". Applicant submits that the structure of claim 26 is fully supported by the specification (see for example, Figure 2b), and that in view of these amendments, Claim 26 (as amended) satisfies the requirements of 35 USC 112. Reconsideration of this rejection is respectfully requested.

Remarks Regarding S. 102 Claim Rejections

Independent claims 1 and 33 were rejected as being anticipated by German Patent Reference DE 2512065A (Nakajima). Applicant submits that the present invention as claimed in claims 1 and 33 are directed to an energy/mass exchange assembly and an associated method in which the assembly may be used, wherein the assembly has an exchange media, a first chamber having a first fluid channel adjacent the exchange media to pass a first fluid stream through the media, and at least a second chamber having a second fluid channel adjacent the exchange media to pass a second fluid stream through the exchanger. The chambers are separated by a divider. The assembly has at least one fluid stream diverter having an adjustable orientation and providing separate flow communications to the chambers through the respective fluid channels. At any given diverter orientation, the separate flow communications are not in fluid communication with the same chamber. In other words, each individual chamber is in flow communication with not more than one fluid stream.

Applicant submits that Nakajima does not disclose an exchanger assembly as claimed in claim 1. In Nakajima, the structural element identified to function as the diverter of the present application is identified as a pilot valve (4), (10), with valve (4) shown best in Figure 4. The pilot valve has a lower ring and an upper ring. Two semi-conical walls extend between the rings, the first semi-conical wall being upright, and the second semi-conical wall being inverted. The semi-conical walls are diametrically opposed, and a flat, solid vertical divider panel extends between the semi-conical walls, so that separate, distinct interior spaces are provided on opposite sides of the divider panel.

The lower ring is divided into four quadrants, two adjacent quadrants being identified as cuts or passages (6). These two passages (6) convey fluid flow from below the lower ring to outlets above the upper ring, through the interior of the inverted semi-conical section. The other two quadrants of the lower ring are not passages, but are covered or blocked by the interior surface of the upright semi-conical section.

The upper ring is also divided into four quadrants. The two quadrants positioned directly above the outer surface of the upright semi-conical wall serve as passages or cuts (6') to convey a fluid flow from between the lower and upper rings, along the outer surface of the upright semi-conical wall, and through an open top of the quadrants (6'). The other two quadrants of the upper ring are in isolated fluid communication with the passages (6) of the lower ring, through the interior space defined by the inverted semi-conical wall structure and the divider panel.

The above description of the valve (4), (10) can be confirmed by reference to the cross-sectional view of the valve (4), (10) in Figure 1.

The Examiner identified the cuts or passages 6, 6' of Nakajima as corresponding to the chambers as claimed in claims 1 and 33. The passages 6, 6' are portions disposed within, and fixed in relation to, the rotary valve 4. Applicant respectfully submits that the passages 6, 6' cannot be considered to disclose the chambers of claim 1, but rather the passages 6, 6' correspond to the first and second isolated passages of the fluid stream diverter of the present invention, as claimed, for example, in the last paragraph of claim 43. Because the passages

6, 6' are entirely contained within the rotary valve 4, the rotary valve 4 (corresponding to the diverter) cannot be adjustably oriented for providing separate flow communications to the chambers, as claimed in claims 1 and 33. To expedite allowance, Applicant has amended claims 1 and 33 to recite "at least one diverter having an adjustable orientation relative to the chambers", thereby further distinguishing the passages 6, 6' of Nakajima from the chambers of claims 1 and 33.

A better candidate disclosed in Nakajima to correspond with the chambers of claims 1 and 33 is the compartments (a) formed by the radial partition plates (15), as seen in Figure 2. But, as can be understood by considering the operation of the heat exchanger of Nakajima, Nakajima fails to provide a structure wherein, at any diverter orientation, separate flow communications are not in fluid communication with the same chamber.

In operation, the isolated passages (6) and (6') are used to separately convey two distinct fluid streams. However, rotation of the valve (4), (10) causes the vertical divider panel (between the semi-conical walls) to rotate relative to the radial partition plates 5 of the housing (1) that holds the media. This is perhaps best understood by considering the top view of the housing (1) illustrated in Figure 2. The divider panel would appear as a straight line bisecting the circular area of the housing (1) into two semi-circular areas. In a rotational orientation where, for example, the divider panel is positioned as a vertical line in Figure 2, the six compartments (a) on the left half of the housing (1) would be in flow communication with one fluid stream, while those on the right half of the housing (1) would be in flow communication with a second fluid stream.

Since the vertical divider panel between the semi-conical sections is a thin wall element (best seen in Figure 4 where the divider panel extends through the lower ring), it is clear that as the valve (4), (10) rotates, each radial compartment (a) will at least temporarily be in simultaneous fluid communication with both fluid streams conveyed by the valve. More specifically, as the divider panel rotates so that it is between the two partition plates (5) bounding any particular compartment (a), that compartment (a) will be exposed to both the fluid stream flowing through passages (6) and to the fluid stream flowing through passages (6'). This mixture of fluids in the compartments (a) can reduce the efficiency of the exchanger assembly.

Applicant submits that Nakajima does not teach an exchanger in which, for any diverter orientation, the separate flow communications are not in fluid communication with the same chamber, as claimed in claims 1 and 33 of the present invention. Therefore, Applicant submits that claims 1 and 33 are novel over Nakajima. Reconsideration of these rejections is respectfully requested.

Claims 2, 3, 5, 9, 11-14, 17, 18, 27, 29-33, 35-40, and 42 were also rejected as being anticipated by Nakajima.

Applicant respectfully submits that these claims depend either directly or indirectly from either claim 1 or claim 33, which are allowable independent claims as argued above. Applicant submits that claims 2, 3, 5, 9, 11-14, 17, 18, 27, 29-33, 35-40, and 42 are therefore allowable in that they depend from an allowable base claim. Reconsideration of those claim rejections is respectfully requested.

Furthermore, regarding claim 12, Nakajima shows only one port 13 in the connection portion, and a second port (for connection to an external fluid stream) is located in the dispersion portion as identified in modified "Figure A" of the Office Action. This structure fails to disclose a connection portion with at least one port in flow communication with each respective fluid channel (at least two channels), as claimed in claim 12. Applicant submits that claim 12 is allowable for this additional reason.

Furthermore, regarding claim 15, Applicant submits that Nakajima does not disclose a fluid stream diverter provided in an inner enclosure which in turn is substantially disposed with the connection portion of a housing. Rather, the valve (4), (10) appears to be disposed in the dispersion portion, as identified in modified Figure A. Applicant submits that claim 15 is allowable over Nakajima for this additional reason.

Remarks Regarding S. 103 Claim Rejections

The Examiner rejected claim 19 as being obvious in view of Nakajima as combined with U.S. Pat. No. 4,856,577 (Katsu et al). Applicant submits that claim 19 depends indirectly from independent claim 1, which is allowable for the reasons set out above. Accordingly, Applicant submits that claim 19 is allowable in that it depends from an allowable base claim.

The Examiner rejected claim 41 as being obvious in view of Nakajima combined with Ekman. Applicant submits that claim 41 depends indirectly from independent claim 33, which is allowable for the reasons set out above. Accordingly,

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Applicant submits that claim 41 is allowable in that it depends from an allowable base claim.

In view of all the above, Applicant respectfully submits that the claims presently on file are patentable over the prior art. Applicant submits that this is a complete response to the outstanding Examiner's communication and that this application is now in condition for allowance. A notice to that effect is respectfully solicited.

If additional fees are required, please charge the fees to our Deposit Account No. 02-2095.

Respectfully submitted,

CARGNELLI et al.

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